

ANNEX 2 (PAM 37100)
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ARMSTRONG FLIGHT RESEARCH CENTER
AND
AEROJET ROCKETDYNE, INC
UNDER
SPACE ACT UMBRELLA AGREEMENT NO. 36944
FOR
CERAMIC MATRIX COMPOSITE DUCT FABRICATION AND TESTING

ARTICLE 1. PURPOSE

The purpose of this agreement is to enhance Hypersonic Flight. NASA will perform load test for a CMC (ceramic matrix composite) duct clamped to a metallic duct. The clamp configuration results in a load path through the flange of the CMC duct where the clamp will be attached. This testing will validate test methods as well as provide insight into the load capability of the CMC duct/clamp configuration.

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the Space Act, Other Transactions Authority (OTA), 51 U.S.C. § 20113(e).

ARTICLE 2. RESPONSIBILITIES

A. NASA Armstrong Flight Research Center (AFRC) will use reasonable efforts to:

1. Instrument the metallic replica of the CMC duct to allow load distributions to be understood without damaging the CMC duct.
2. Instrument CMC duct with strain gauges to measure loads at room/nominal temperatures.
3. Perform testing using AFRC FLL loading systems.
4. Provide test data and test documentation.

B. Partner will use reasonable efforts to:

1. Provide the test articles, metallic and CMC.
2. Provide test and instrumentation requirements.

ARTICLE 3. SCHEDULE AND MILESTONES

The planned major milestones for the activities for this Annex defined in the "Responsibilities" Article are as follows:

- | | |
|---|---|
| 1. Partner to provide NASA with test and instrumentation requirements, as well as access to information and support necessary to carry out its responsibilities under this Annex. | Within two months of the Annex being executed |
| 2. NASA to conduct metallic and CMC duct tests and provide test data. | Within 3 months of completion of Milestone 1. |

ARTICLE 4. FINANCIAL OBLIGATIONS

A. Partner agrees to reimburse NASA an estimated cost of \$53,091 for NASA to carry out its responsibilities under this Annex.

Each payment shall be marked with Armstrong Flight Research Center PAM Number 37001.

B. NASA will not provide services or incur costs beyond the current funding. Although NASA has made a good faith effort to accurately estimate its costs, it is understood that NASA provides no assurance that the proposed effort under this Annex will be accomplished for the estimated amount. Should the effort cost more than the estimate, Partner will be advised by NASA as soon as possible. Partner shall pay all costs incurred and have the option of canceling the remaining effort or providing additional funding in order to continue the proposed effort under the revised estimate. Should this Annex be terminated, or the effort completed at a cost less than the agreed-to estimated cost, NASA shall account for any unspent funds within 1 year after completion of all efforts under this Annex, and promptly thereafter, at Partner's option return any unspent funds to Partner or apply any such unspent funds to other activities under the Umbrella Agreement. Return of unspent funds will be processed via Electronic Funds Transfer (EFT) in accordance with 31 C.F.R. Part 208 and, upon request by NASA, Partner agrees to complete the Automated Clearing House (ACH) Vendor/Miscellaneous Payment Enrollment Form (SF 3881).

ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

A. Data produced under this Annex which is subject to paragraph C of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of one year.

B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data provided.

1. Background Data:

The Disclosing Party's Background Data, if any, will be identified in a separate technical document.

2. Third Party Proprietary Data:

The Disclosing Party's Third Party Proprietary Data, if any, will be identified in a separate technical document.

3. Controlled Government Data:

The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.

4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement: None

ARTICLE 6. TERM OF ANNEX

This Annex becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or one year from the Effective Date, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

ARTICLE 7. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Annex by providing thirty (30) calendar days written notice to the other Party.

ARTICLE 8. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Annex.

Management Points of Contact

NASA Armstrong Flight Research Center

Darren S. Cole (Primary)
AST, ENGINEER PROJECT
MANAGEMENT
Mail Stop: 48202A
Armstrong Flight Research Center
Edwards, CA 93523
661-276-5536
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AEROJET ROCKETDYNE, INC

Stephen Smithwick
Sr. Manager, Supply Chain
Management-WPB Programs
15270 Endeavor Drive
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Stephen.smithwick@rocket.com

NASA Langley Research Center

Shelly M. Ferlemann
AST, ENGINEER PROJECT
MANAGEMENT
Mail Stop: E1A

Langley Research Center
Hampton, VA 23681
757-848-0048
shelly.m.ferlemann@nasa.gov

ARTICLE 9. MODIFICATIONS

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

ARTICLE 10. SIGNATORY AUTHORITY

The signatories to this Annex covenant and warrant that they have authority to execute this Annex. By signing below, the undersigned agrees to the above terms and conditions.

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
ARMSTRONG FLIGHT RESEARCH
CENTER

AEROJET ROCKETDYNE, INC

BY: _____
Laurie Grindle,
Director for Programs and Projects

BY: _____
Stephen Smithwick
Sr. Manager, Supply Chain
Management-WPB Programs

DATE: _____

DATE: _____